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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,930	10/31/2003	Anant Achyut Setlur	128454	8944

6147 7590 09/21/2005

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
NISKAYUNA, NY 12309

EXAMINER	
KOSLOW, CAROL M	

ART UNIT	PAPER NUMBER
1755	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/697,930	SETLUR ET AL.	
	Examiner	Art Unit	
	C. Melissa Koslow	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-31 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6, 8-12, 14-17, 20-26 and 28-31 is/are rejected.

7)☒ Claim(s) 7,13,18,19 and 27 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 31 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/31/03,3/21/05.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The disclosure is objected to because of the following informalities: The degree symbols is missing from all the temperatures. Applicants need to indicate, in the specification, if all the elements in the parentheses in the formulas, "(Cl,F,OH)" and "(Ba,Sr,Ca)" are present or if there is at least one of the listed elements are present. The art interprets elements in parentheses both of the above ways. Appropriate correction is required.

Claims 1, 2, 4, 5, 8, 10, 11, 16-18, 20-22, 24 and 25 are objected to because of the following informalities: In claims 1, 2, 4, 5, 8, 10, 11, 16, 17, 20-22, 24 and 25, the Markush phrase "at least a" is incorrect and should be replaced by the correct format "at least one". In claim 18, "is" is missing from the phrase "boron is H_3BO_3,". In claims 16 and 20, the degree symbol is missing from the temperatures. Finally, in claim 20, "and" is missing from between "yttrium" and "elements" in line 5 of part b. Appropriate correction is required.

Claims 16 and 20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for producing phosphors having the formula $DA_3B_4O_{12}$:Eu, where D is at least one of Y or any lanthanide element excluding europium and A is at least one of Al, Ga, Sc and In, does not reasonably provide enablement for phosphors comprising boron, europium, at least one of Y or any lanthanide element excluding europium and at least one of Al, Ga, Sc and In. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The claims recite phosphors comprising boron, europium, at least one of Y or any lanthanide element excluding europium and at least one of Al, Ga, Sc and In. This encompasses any borate phosphor such as europium and terbium activated indium borate. However, the

specification only teaches phosphors having the formula $DA_3B_4O_{12}$:Eu, where D is at least one of Y or any lanthanide element excluding europium and A is at least one of Al, Ga, Sc and In. Such a limited disclosure does not support the breadth of the instant claims. The examiner suggests the incorporation of phosphors having the formula $DA_3B_4O_{12}$:Eu, where D is at least one of Y or any lanthanide element excluding europium and A is at least one of Al, Ga, Sc and In into claims 16 and 20.

Claims 14, 15, 29, 30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims are indefinite since it is unclear if all the elements in the parentheses in the formulas, "(Cl,F,OH)" and "(Ba,Sr,Ca)" are present or if there is at least one of the listed elements are present. The art interprets elements in parentheses both of the above ways.

The Examiner is interpreting the formulas with the parentheses as that at least one of the listed elements is present. Thus $(Ba,Sr,Ca)MgAl_{10}O_{17}$:Eu is being interpreted as $MMgAl_{10}O_{17}$:Eu, where M is at least one of Ba, Ca or Sr.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6, 8-12, 14, 15, 21-26 and 28-31 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 8-10, 18 and 22-23 of copending Application No. 10/317,423. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of application 10/317,423 teaches a mercury vapor lamp comprising a blend of phosphor comprising $(Y,Gd)Al_3B_4O_{12}$:Eu, as the red phosphor; $LaPO_4$:Ce,Tb as the green phosphor; $Sr_4Al_{14}O_{25}$:Eu as the blue-green phosphor and $BaMgAl_{10}O_{17}$:Eu as the blue phosphor. $(Y,Gd)Al_3B_4O_{12}$:Eu encompasses the formulas $YAl_3B_4O_{12}$:Eu, $GdAl_3B_4O_{12}$:Eu and $(Y_{1-x}Gd_x)Al_3B_4O_{12}$:Eu, where $0<x<1$. While the amount of europium is not given in the taught borate phosphor, one of ordinary skill in the art knows that it is the amount that is effective to activate the phosphor. This amount would at least overlap the claimed range, which is effective to activate the phosphor. The reference suggests the claimed phosphor, phosphor blend and light source.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-6, 8-12, 14, 15, 21-26 and 28-31 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6, 11, 16, 21 and 26 of copending Application No. 10/317,424. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of application 10/317,423 teaches a mercury vapor lamp comprising a blend of phosphor comprising $(Y,Gd)Al_3B_4O_{12}$:Eu, as the red phosphor; $LaPO_4$:Ce,Tb as the green phosphor; and

(Ba,Sr,Ca)$MgAl_{10}O_{17}$:Eu as the blue phosphor. (Y,Gd)$Al_3B_4O_{12}$:Eu encompasses the formulas $YAl_3B_4O_{12}$:Eu, $GdAl_3B_4O_{12}$:Eu and $(Y_{1-x}Gd_x)Al_3B_4O_{12}$:Eu, where $0<x<1$. While the amount of europium is not given in the taught borate phosphor, one of ordinary skill in the art knows that it is the amount that is effective to activate the phosphor. This amount would at least overlap the claimed range, which is effective to activate the phosphor. The reference suggests the claimed phosphor, phosphor blend and light source.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by EP 406,554 and U.S. patent 4,512,912.

Both of these references teach a phosphor comprising europium, boron, a lanthanide metal besides europium and either indium or aluminum. EP 406,554 teaches teach a phosphor comprising europium, boron, aluminum and at least one of Lu, La or Y and teach a phosphor comprising europium, boron, aluminum, terbium and at least one element selected from In, Ga or Sm. U.S. patent 4,512,912 teaches teach a phosphor comprising europium, boron, terbium,

indium and at least one of Sc, Lu, Y, La, Gd and Ga. The references clearly teach the claimed phosphor.

Claim 1 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. patent 6,673,473 or 6,517,741.

Both of these patents teach phosphors having the formula $YAl_3B_4O_{12}$:Eu and $LaAl_3B_4O_{12}$:Eu. The references clearly teach the claimed phosphor.

Claims 1 and 16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. patent 4,604,549.

Claims 1 and 16 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. patent 6,509,685.

Both of these patents teach the claimed phosphor and the method for making it. U.S. patent 6,509,685 teaches a phosphor comprising boron, yttrium, europium and scandium and/or indium which is produce by mixing oxides of yttrium, europium and scandium and/or indium and boric acid and heating the mixture at 1250°C to form the phosphor. Since the atmosphere is not given, it is assumed to be air since it is conventional practice in art not to give the heating atmosphere if it is air. U.S. patent 4,604,549 teaches a phosphor comprising boron, terbium, europium and indium which is produce by mixing oxides of terbium, europium and indium and boric acid and heating the mixture at 1000-1400°C in air to form the phosphor.

Claims 1, 16 and 21 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 56-155282 or JP 56-155281.

The abstracts for these references teach phosphors comprising gadolinium, europium, boron and either gallium or aluminum. They are produced by mixing oxides of the above metals

and heating the mixture in air at 1000-1400°C. The taught phosphors are used in fluorescent lamps which have a source of UV radiation located in a sealed housing.

Claims 1, 21, 28 and 29 are provisionally rejected under 35 U.S.C. 102(e) as being anticipated by copending Application No. 10/37,424 which has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e), if patented. This provisional rejection under 35 U.S.C. 102(e) is based upon a presumption of future patenting of the copending application.

This provisional rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

This rejection may not be overcome by the filing of a terminal disclaimer. See *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991).

This reference teaches a light source comprising mercury vapor discharge as a UV source that is located in a sealed housing and a phosphor having the formula $(Y,Gd)Al_3B_4O_{12}$:Eu. The taught device can also contain $LaPO_4$:Ce,Tb; $Sr_4Al_{14}O_{25}$:Eu; $BaAl_8O_{13}$:Eu. The reference clearly teaches the claimed phosphor and device.

Claims 1-6, 16, 17 and 21-26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 2000-290648.

This reference teaches phosphors having the formulas $(Gd_{1-x}Eu_x)Al_3B_4O_{12}$ where x is 0.005-0.2; $(YGd_{0.9}Eu_{0.1})Al_3B_4O_{12}$; $(LaGd_{0.9}Eu_{0.1})Al_3B_4O_{12}$; $(Y_{0.9}Eu_{0.1})Al_3B_4O_{12}$;

$(La_{0.9}Eu_{0.1})Al_3B_4O_{12}$ and $(Gd_{0.9}La_{0.5}Y_{0.5}Eu_{0.1})Al_3B_4O_{12}$. These phosphors all fall within the claimed formulas. The phosphor is used as the source of red in fluorescent lamps which have a source of UV radiation located in a sealed housing. Thus the reference teaches the claimed device. The phosphor is produced by combining oxides of the desired metals and heating the mixture at 1000-1400°C in air until the phosphor is formed. The reference teaches the claimed process.

Claims 1-6, 16, 17 and 21-26 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. patent 6,676,853.

This reference teaches a phosphor having the formula $Gd_{1-a}Eu_aAl_3B_4O_{12}$, where a is 0.003-0.5 and $(Gd_{1-x}Y_x)_{1-a}Eu_aAl_3B_4O_{12}$, where a is 0.003-0.5 and x is 0.005-0.95. Examples 4 and 5 teach compositions where a is 0.05. The exemplified compositions fall within the claimed formula. The reference teaches the phosphor is produced by mixing oxygen containing compounds of Gd, Eu, Y, Al and B and heating the mixture in air at 900-1100°C until the phosphor forms. Thus the reference teaches claimed method of making the phosphor. Finally, the taught phosphors are used in rare gas lamps, which have a source of UV radiation located in a sealed housing. The reference teaches the claimed light source.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 406554.

This reference teaches producing a phosphor comprising europium, boron, aluminum and at least one of Lu, La or Y or a phosphor comprising europium, boron, aluminum, terbium and at least one element selected from In, Ga or Sm by mixing oxide sources of the desired metals and firing mixture in air at 900-1700°C until the phosphor forms. This temperature range overlaps the claimed range. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed method.

Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6,673,473 or 6,517,741.

As stated above, both of the patents teach phosphors having the formula $YAl_3B_4O_{12}$:Eu and $LaAl_3B_4O_{12}$:Eu. It is well known in the art that the europium substitutes for the yttrium and lanthanum in these phosphors. The references do not teach the amount of europium, one of ordinary skill in the art knows that it is the amount that is effective to activate the phosphor. This amount would at least overlap the claimed range, which is effective to activate the phosphor. The references suggest the claimed phosphor.

Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-290648 or U.S. patent 6,676,853.

As discussed above, both of these references teach the claimed phosphor. The references teach the phosphors are used as the red phosphor in rare gas lamps. This suggests that the phosphor is blended with at least a green and blue phosphor to form the lamp, which emits white light. Thus the references suggest the claimed blend.

Claims 7, 13, 18, 19 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

There is no teaching or suggestion in the cited art of record of a phosphor having the claimed formula $(Gd_{1-y}Y_y)_{1-x}(Al_{1-q-r}Sc_qGa_r)_3B_4O_{12}$:xEu, where x is about 0.001-0.3, $0<y<1$, $0<q<1$ and $0<r<1$. There is no teaching or suggestion in the cited art of record of producing $D_{1-x}A_3B_4O_{12}$:xEu, where D, X and A have the claimed definitions, by combining oxygen containing compounds of Eu, A and D and an stoichiometric excess amount of H_3BO_3 and the heating the mixture at about 900-1400°C in air to form the phosphor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk
September 16, 2005

C. Melissa Koslow
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